Agricultural Development in Burma: Problems and Prospects

U Tin Soe
Department of Agricultural Economics
University of Sydney, NSW 2006

Contributed Paper Presented to the 34th. Annual Conference of the Australian Agricultural Economics Society, University of Queensland, St.Lucia, 13-15 February, 1990

Agricultural Development in Burma: Problems and Prospects*

U Tin Soe

The efforts of successive governments in post-Independence Burma have been centred on formulating policies and plans to remedy the colonial patterns of agricultural development and secondly achieving a diversified and balanced growth in agriculture that could contribute to the stable growth of the national economy. This paper examines the extent to which these objectives have been realised and outlines the problems created.

Slow growth occurred from 1948 to 1962 due to stagnated productivity as a consequence of primitive technolgy but the policy objectives were fairly well realised. Changes in policies after 1962-63 led to unstable production, official procurement, exports and imports. It caused structural imbalances among industries, leading to the emergence of black markets and cost-push inflation. Policy revisions after 1973-74 together with infusion of more investment and massive introduction of the HYVs into agriculture prompted high yields and increased output. However, it was sustained only for a short period of five years until 1980-81.

Past experience suggests that a policy with minimum government regulation to ensure normal functioning of the free market seems to be preferable. There is ample evidence to suggest that good prospects and potential for rapid growth of Burmese agriculture exist in the future. The main inhibiting factors from realising these potentials so far have been insufficient supply of inputs and other services, lacking in capital investment, structural imbalances, and misleading priority of the development plans. All these were largely related to the inefficient policies and management sytem. The future prospects of Burmese agriculture therefore depends on how quickly and effectively the reforms could be undertaken to remedy them.

Introduction

The initial self-sufficient feudal basis of Burmese agriculture was transformed into a highly commercialised one under the (British) colonial *lassaiz faire* policy beginning from the early 1860's. The process of transformation was so rapid that Burma became the leading rice exporter of the world to be known as 'Rice Bowl of Asia' within three decades from 1870. Economic historians generally agreed that the Burmese farmers had not benefited much from this rapid growth. In addition to the massive destruction of the agricultural infrastructure caused by the World War II, Burmese agriculture inherited three major problems from the colonial pattern of development when she gained her independence in 1948. These problems were (1) indebtedness of the farmers; (2) alienation of land to the absentee-landlords and land tenure problems; and (3) lop-sided development depending almost entirely on one or few crops for export leaving the domestic economy highly vulnerable to the changes in the world market[1]

Policy Objectives

The emphasis of economic policies in Burma after independence was on reconstruction, industrialisation, and agricultural diversification. Accordingly, the agricultural policy objectives until 1962 have been (a) to restore the pre-war levels of output and export, (b) to carry out effective land reforms, (c) to increase agricultural production and promote export,

---

*The names of Burma and Rangoon have changed to Myanmar and Yangon respectively in 1989. However, the old names, Burma and Rangoon, are used in this paper because the time period specified for this study is for a 40 year peiod ending in 1988 i.e., before the change of names. I am indebted to Dr.R.L.Batterham, Dept. of Agricultural Economics, University of Sydney, for his invaluable help without which this paper could not have completed. I am solely responsible for errors in, or omission of, the paper.

[1]For further information on the experiences and problems of agricultural growth in Burma during the colonial period, see, among others, Furnivall (1957) , '*An Introduction to the Political Economy of Burma*' and U Aye Hlaing, '*Trends of Agricultural Growth in Burma: 1870-1940*' (1965).

and (d) to fix the prices of agricultural products and to establish the agricultural marketing board (Kyi 1981, p.3).

After 1962, emphasis of economic policy has changed to domestic food self-sufficiency and balanced growth of agriculture and industry. In conformity with this change in priority, notable changes in agriculture after 1962-63 included (a) replacing the previous land holding rights by land tilling rights, (b) increasing provision of government agricultural loans; and (c) supply and provision of chemical fertilisers and other related inputs and services. In 1973, a 'Long-term and Short-term Economic Policies of the Burma Socialist Programme Party' was announced in a 'Twenty Year Plan: 1973/74 - 1993/94'. The main agricultural policy objectives as given in this 'Plan' were (a) to attain self-sufficiency of food; (b) to produce sufficient raw materials for the agro-allied industries at home; and (c) to maximise the foreign exchange earnings by expansion of agricultural export (MAF 1987, pp.7-8).

Performance

Growth of Agricultural Output, Inputs, and Productivities

For the purposes in this study, total productivity approach as defined in Yamada's (1975) work was adopted, and labour productivity, land productivity, total productivity index, and capital-output ratio used in this study were accordingly defined as follows:

$$\text{Labour productivity} = \frac{\text{Total agricultural net output}}{\text{Active labour force engaged in agriculture}}$$

$$\text{Land productivity} = \frac{\text{Total agricultural net output}}{\text{Actual land area under various crops}}$$

$$\text{Total productivity} = \frac{\text{Total net output index}}{\text{Total input index}}$$

Total output index = index of value of total agricultural net output

Total input index = weighted average of the indices of labour, land, capital, and current inputs measured with factor shares as weights.

$$\text{Capital-Output Ratio} = \frac{\text{Total value of fixed capital stock}}{\text{Value of total agricultural net output}}$$

Agricultural sector in this study, unless otherwise stated, refers to crop cultivation sector alone. Due to data problems, the value of 'agricultural net output' used in the study consists of the value of all crops (about 80-85 percent) and that of livestock products (about 15-20 per cent). Agricultrural land comprises 'net sown area' plus 'mixed and multiple area' of crops.

Growth of Output

The growth of agricultural net output (at 1961-62 constant prices) since 1947-48 is summarised in Table 1. A generally increasing trend of output was observed for the period as a whole but was subject to severe fluctuations. The overall growth rate for the whole period (3.4 per cent per annum) exceeded the population growth rate (2 per cent per annum). (Per annum hereafter will be denoted as p.a.). The output grew moderately for more than 25 years until 1975-76 with fluctuating and inconsistent rates but the growth rates were impressive during 1975-76 and 1980-81. This was a period of productivity breakthrough for the first time in post-independence Burma. The output growth began to decline after 1980-81 at an increasing rate which was negative in 1987-88.

The output growth by decades show some interesting trends. The rate of increase was low (1.4 % p.a.) but stable during the first decade (1947/48-56/57), higher (4 % p.a.) but instable during the second decade (1957/58-66/67), modest and stable (2.5 % p.a.) during the third

decade (1967/68-76/77), and much higher (6 % p.a.) but not sustained during the last decade (1977/78 - 87/88). Division of the whole period into two broad sub-periods as the 'free economy period' (1947/48-61/62) and the 'controlled economy period' (1962/63-87/88) showed that the latter period performed better only in productivity and output growth with severe decline in procurement and export whereas the former period displayed a low but stable growth in all production, procurement, and export.

Growth of Inputs

Labour Force

The increase in agricultural labour force[2] varied between decades. For the period as a whole, the growth rate was 1.6 per cent p.a. which was below that of population growth rate (2.1 % p.a). It began with a 1.5 per cent p.a growth rate during the first decade, declined to 1 per cent p.a. during the second decade but more than doubled (2.3 % p.a.) in the next decade, and finally decreased again to 1.5 per cent p.a. during the last decade. It was noted that growth trend of agricultural labour force reflected the growth trend of cultivation sector.

Land Input

The growth of land input[3] is summarised in Table (2). The cultivated area grew very modestly throughout the period under consideration. The overall growth rate was just over 1 per cent p.a. while the across-decade growth rates were below 1 per cent p.a. each for the first, third, and fourth decades respectively. Only during the second decade that the land grew at 3 per cent p.a. A similar pattern was observed for the growth of net sown area of land.

Fixed Capital

Of the fixed capital items considered[4], the state capital expenditure showed a very impressive rate of growth but the absolute amount was very small. Because the initial absolute amount was very small, any increment to that amount gave an impressive rate of growth. To avoid this 'lie with statistics', average per hectare and per worker state capital expenditure was used. The absolute amount of per hectare and per worker state capital expenditure for the whole period were Kyats 24.40 and 27.15 respectively. (Burmese currency, Kyat, hereafter will be denoted as K.). The per hectare figures across decades from the first through the last were K. 3.61, K 9.79, K.7.74, and K.76.44 respectively , and for per worker K 4.38, K 12.34, K 9.24, and K 82.64 respectively. Per unit state capital expenditure was not more than a week's wage of a hired labourer which was initially fixed at K 3.15 and raised to K 6.50 later. Until 1976-77, the state capital expenditure was not effective in the light of requirement of massive investment

---

[2]The economically active population in agriculture is regarded as the agricultural labour force in Burma which is defined to include owner-cultivators, tenants, hired labourers paid in kind or in cash, part-time and full-time seasonal workers, and unpaid household members assisting in their family farms. See Mya Than (1988) 'Growth Pattern of Burmese Agriculture', Occasional Paper No. 81, ISAS, pp. 9-17. The labour input data for this study were obtained from various issues of the *Economic Survey of Burma* and *Repot to the Pyithu Hluttaw* , published by the Ministry of National Planning, and *Season and Crop Report*, published by the Ministry of Agriculture and Forest.

[3]The land input includes the 'agricultural land' consisting of net sown area plus mixed and multiple crops area. Fallow land area and the land under permanent crops such as plantation were excluded. Some studies includes fallow land (Mya Than 1988) and land under permanent crops (Yamada 1975) in land inputs but land under permanent crops such as rubber plantation and coconut plantation etc was excluded in this study because of data problem. The fallow land was also excluded because they were rarely brought under cultivation and was not very significant compared with the actual land area under cultivation.

[4]Fixed capital considered includes state capital expenditure, tractors, draught cattles (i.e., oxen and water buffaloes), ploughs, harrows, and bullock carts for which fairly 'consistent' data were available. The estimated prices of them were obtained from *Economic Survey of Burma, Report to the Pyithu Hluttaw* , and several other semi-official and independent sources of which the rural surveys undertaken by the Institute of Economics, Rangoon, and Mya Than (1988), *'Growth Pattern of Burmese Agriculture : A Productivity Approach'* and Tin Soe (1979) 'Agricultural Development of Burma, 1855-1975; A Total Productivity Approach' were mostly depended. The values of agricultural buildings, farm machinery other than tractors, and agricultural perennial plants are excluded for lack of reliable data.

for agricultural sector. It was only during the last decade that both per hectare and per worker capital expenditure of the state increased significantly.

Because tractors were inefficient and ineffective[5], the draught cattles remained as the crucial power in farming. However, the growth of draught cattle, oxen and water buffaloes, was modest (1.5 % p.a) over the whole period. A fairly high growth rate of 4 per cent p.a.was observed only during the first decade which declined to around 0.5 per cent p.a during the later decades. This slow growth in draught cattle and limited irrigation capacity inhibited the growth of crop cultivation. Other agricultural implements in use also grew modestly; the lowest growth rates being during the third and last decades of the closed economy period.

Current Inputs

The growth of current inputs[6] since 1949-50 were summarised in Table (2). Generally, it was also extremely low in per hectare or per worker terms. However, fertiliser use grew dramatically both in total volume and per acre terms. Over the period as a whole, for example, the volume of fertilisers used grew from 3.2 million tons in 1949-50 to 400 million tons in 1987-88. The figures across the decades were also impressive; ranging from 21 to 42 per cent p.a.during the first three decades until 1976-77. It slowed down after 1976-77 but the rate was still impressive (12 % p.a.) during the period between 1976-77 and 1980-81. The use of other farm chemicals such as pesticides and insecticides also increased. It was due mainly to the massive introduction of HYVs in early 1970s, and government's subsidisation of fertiliser sale to the farmers who have to pay only about 22 per cent of the cost for fertilisers. Per acre fertiliser use also increased. It was noted, however, that the levels of usage were still lower than the recommended levels domestically, and also much lower than that used in neighbouring countries. The main cause was insufficient supply of fertiliser (IER *Survey* 1982). Nevertheless, the increased use of fertilisers following the introduction of the HYVs was the main driving force in raising the agricultural output in the late 1970s. It is evidenced by the fact that the decline in the use of fertilisers and chemicals was followed by a sharp decrease in agricultural output after 1980-81. This suggests that the potential of productivities of currently cultivated land can be increased further if sufficient fertiliser and other inputs could be supplied.

Productivity Growth

Four types of productivities; viz., labour, land, capital-output ratio, and total productivity index were considered, the results of which are summarised in Table (3).

Labour Productivity

The notable features of the labour productivity are that the overall growth rate (0 9% p.a) was much lower than that of the total net output (3.4 % p.a) for the whole period; the trend was inconsistent and instable characterised by insignificant growth rates until 1976-77; and that the impressive growth rate of 5 per cent p.a. during the first half of the last decade (1977/78-80/81) was not sustained. The rate declined to a mere 1 per cent p.a.after 1980-81 and finally became negative (-2.5 %) in 1987-88.

Land Productivity

The land productivity over the whole period grew a little over 1 per cent p.a. which was very close to that of labour productivity. However, during the last decade ending in 1987-88, land productivity grew considerably higher (4 % p.a) than that of labour productivity. The impressive growth rate in land productivity was recorded during the first half of the last decade

---

[5]Tractors were not relevant for agricultural growth in Burma for a number of reasons. The types of tractors were not much suitable to the muddy land of the delta areas where most important crops including rice were grown. The availability of tractors, especially in the peak season, was also constrained by the unserviceability of tracotrs (about 60 per cent of tractors were unserviceable) due to lack of spare-parts and maintenance service. Tractors were therefore mainly used in the cultivation of the second crops such as jute and cotton while in rice cultivation, it is used only as a supplementary tool.

[6]Current inputs considered include state current expenditure, chemical fertilisers, and farm chemicals such as insecticides and pesticides for which the data were available.

decade (over 6 % p.a) which deteriorated during the second half of the decade leading to a negative growth rate in 1987-88.

Capital-Output Ratio
The notable features were that the ratio increased on the average by nearly 2 per cent p.a. over the whole period but the only decade with a high rate has been the first decade (8 % p.a). The ratio grew negatively during the second and last decades (-1.8% p.a. and -0.3 %p.a. respectively) while the third decade displayed a very low positive rate (0.6 % p.a.).

Total Productivity Index
The total productivity index[7] over the whole period grew negatively (-1.7 % p.a). Taking 1947-48 as the base year, it declined continously that the index in 1987-88 was less than 50 per cent of that in 1947-48. Taking 1961-62 as the base year, it was 2 per cent lower than that in 1947-48 but 50 per cent higher than that of 1987-88. As for the decades, the second decade recorded a modest rate (1 % p.a) while a considerably high rate (5 % p.a) was observed during the last decade. The rates were negative during the first and third decades (-2.4 % p.a. and -3 % p.a. respectively).

In sum,
(1). Productivities of all inputs grew at reasonably high rates only during the last decade. Even then, the performance was better only during the first four years of the decade;
(2). Land productivity was the only factor that consistently showed a positive growth rates in all four decades but the rates for the first two decades were low. On the other hand, labour productivity displayed low and inconsistent rates during the last three decades;
(3). The high growth rate of capital-output ratio was observed only during the first decade. It declined consistently during later decades and became negative in 1987-88.

Relationships Between Output and Input Factors
A simple regression was run[8] to determine the relationships between agricultural net output and input factors for the period from 1947-48 to 1987-88 as well as for the sub-periods. The sub-periods were determined by the time period representing different policy and economic system as shown below.

Sub-period	Characteristics of the period
Sub-period I: 1947/48-61/62	Mixed economy with the leading role of the free market under the parliamentary democracy system.
Sub-period II: 1962/63-87/88	Closed and controlled economy first under military rule (1962/63-73/74), and later under one-party socialist state (1974/75-87/88) prevailed.
(a) First Phase of Sub-period II: 1962/63-1973/74	Economy was controlled and managed by adhoc 'Decrees' and 'Directives' under the Revolutionary Council and government.
(b) Second Phase of Sub-period II: 1974/75-1987/88	Economy was guided and managed by 'central planning' under the socialist government which collasped and ended in August, 1988.

[7]The total productivity index is defined as the ratio between the total net output index and the total input index which is the weighted aggregate of the indices of labour, land, fixed capital, and current inputs. Factor shares used as weights were given in the footnotes of the respective tables.

[8]The functional form of the regression was specified as

$$Y = a_1 + b_1LD + b_2LR + b_3 CO + b_4TP$$

where Y is total agricultural net output, LD, LR, CO, and TP are land, labour, capital-output ratio, and

The results of the regression analyses for these periods were summarised in Tables (4) and (5) and some notable features of the relationships between total output and various factors were briefly discussed below.

Over the Whole Period: 1947/48 to 1987/88
The coefficients of both land and labour productivities to output were significant indicating that land and labour were the two main determining factors for increased output. It was observed that the coefficient of labour productivity to output was not as consistent as that of land coefficient to labour productivity. The magnitude of coefficeint of capital-output ratio to total net output was the smallest. In the relationsip between total productivity index and other factors, it was observed that the coeffcient for total net output was the largest of all followed by coefficients of land, labour, and capital-output ratio respectively. The coefficient of capital-output ratio to total productivity index was small.

Sub-period I: The Free Economy Period; 1947/48 to1961/62
Although the correlation coefficients for this period were generally small compared with that of the whole period, the contribution of land productivity to total net output and to total productivity seemed to be the highest, follwed by labour productivity's contribution. The coefficient of the capital-output ratio was very small, suggesting that capital has been the main limiting factor to total productivity growth during this phase, and the output was being enhanced mainly by extensive use of land and labour which have been abundant in supply.

Sub-period II: Controlled Economy Period; 1962/63 to 1987/88
Land productivity became the leading and most prominent contributing factor to total productivity and to total net ouput follwed by labour productivity, total productivity index, and capital-output ratio. Two notable features in this period were that (1) total productivity began to contribute to the increased total net output, and (2) the capital-output ratio also contributed considerably to both the total productivity and total net output. This pattern reflected the relative increase in investment in cultivation sector during this period in terms of introducing the HYVs and using fertilisers and other farm chemicals.

First Phase of Controlled Economy Period: 1962/643 to 1973/74
Land productivity became predominantly important to the increase of total net output but not to that of total productivity. Capital-output ratio for the first time became an important factor to contribute to the growth of total productivity followed by labour productivity. It was noted that capital-output ratio became almost equally important to that of labour productivity in contributing the increase of total net output. However, except for land productivity, coefficients for other factors were still relatively small during this phase.

Second Phase of Closed and Controlled Economy Period: 1974/75 to 1987/88
Both land and labour productivities remained dominant in contributing to the growth of total net output but their relative role to that of total productivity remarkably declined. The magnitude of the coefficients of relationship between land and labour productivities to total productivity remained only about half of that to total net output during this period. This might have been caused by the decline in both state current and capital expenditures in agriculture after 1980-81 which was reflected by a very small capital-ouput ratio. The correlation and regression coefficients computed therefore enabled to capture the pattern and trends of growth of factors and productivity quite realistically.

In sum, notable features of the relationships between the total net output and various factors, as indicated by the regression results, were that
(1) Capital-saving and land and labour-using methods have been the main contributing factors to output growth during the period until 1961-62;
(2) Land-saving and capital-using techniques that were initiated during the First Phase of Sub-period II have paved the way for beginning of not only output growth but also of increase in labour productivity and capital-output ratio;
(3) The importance of capital-output ratio was confirmed by the fact that all other relationsiphs ere distorted once this ratio was decreased again in the Second Phase of Sub-period II.

The impact especially on the land-labour relationships and consequently on total productivity was obviously great; and

(4) During the period under consideration, land-intensive technology has been preferred to all other technologies especially after 1962-63.

HYVs and Agricultural Diversification

Up until 1961-62, diversification of crops was achieved in terms of introducing some new crops but raising productivities of them failed. When the domestic consumption rate increased faster than that of production during the 1960's, rice exports declined to the level that 'it is hard for supplies to satisfy its own urban and deficit area population' (Richter 1976, p.1). This and other factors contributed to the urgency of raising the productivity and output of agriculture which finally forced Burma to join the 'Green Revolution' by introducing the high yielding varieties (HYVs) of rice in late 1960's. However, it took nearly a decade to take advantage of the major technological breakthroughs due to a number of constraints[9]. From the mid-1970's there were dramatic increases in yields of HYVs of rice due to good weather and a package of support of the government. With the experience gained, a new strategy designated as 'The Whole Township Special High Yield Rice Programme' was launched in 1977-78 in two townships. In 1983-84 the 'Programme' was extended to 82 townships covering an area of 6.34 million acres (or 2.63 million hectares) representing 53 per cent of total cultivated area of rice. Between 1977/78 and 1983-84, rice production increased from 9 million tons to 14 million tons; the overall growth being 55 per cent. When the area of local improved varieties of rice is added, the total cultivated area of HYVs of rice was 9.4 million acres (or 3.9 million hectares) in 1983-84 representing over 75 per cent of total rice area. Fertiliser use therefore increased rapidly and, combined with the HYVs, has been the main source of yield increases. Rice itself was grown twice during a rice season by introducing short-duration improved strains of rice which was disrupted later due to shortage of input supplies.

The success of the HYV programme in rice has encouraged the government to launch similar programmes for other crops. Some new crops were introduced while emphasis was also given to replace the existing low-yield varieties with the high yield ones. In 1979 the high yield programme was extended to six other crops, and further to 19 crops in 1981. These included wheat, maize, millet, pulses, sunflower, sesame, palm-oil seed, cotton, jute and sugar-cane. About 20 per cent of fertilizer is now used in these crops. Other support such as the provision of loans was also given by the government. Consequently, output of most major crops have increased substantially since 1980 which have come mostly from higher yields, although the sown area of some crops has also increased. This has significantly increased total cereal grain output. Self sufficiency was achieved in commodities such as cotton which were previously imported, and a few new crops, such as maize, became a relaively important export item.

These developments naturally shifted resources from the major crop, rice. Hill and Jayasuriya (1986, p.46) argue that the shift of resources (such as fertiliser) into other crops was partly due to diminishing marginal returns from further investment in rice. There is not sufficient evidence to confirm that marginal returns were diminishing from further investment in rice. On the contrary, available evidence showed that the rice industry was characterised by under-investment. Fetilizer was still under-used, both state current and capital investment were still very low, and credit and other extension services were still lacking (Tin-Soe 1976, Mya-Than 1979, Aung-Myint 1987). Increasing marginal returns from investment in rice are still evident (Khin-Win and Nyi-Nyi 1980, Mya-Than 1988) but the main problem has been not the marginal returns but that of shortage of input supplies and investment. In actual fact, when emphasis on the HYVs of rice was given by the government, priority was also given to the supply of all major inputs for cultivation of rice. As a result, rice yields and production increased dramatically but at the expense of other crops. Consequently, shortage of these basic food crops has pushed domestic retail prices up to an extent that government policy of maintaining low food price and wage was upset and prices and markets began to distort. The urgency of remedying this situation has prompted the government to emphasize on these crops,

[9]These were the unsuitability of the earlier imported new varieties to the local condition, lack of irrigation facilities and other modern inputs such as chemical fertiliser, and lack of awareness of the farmers concerning the superiority of the new variety and associated improved cultivation practices.

and hence shift of the already limited resources. This has increased the ineffectiveness of input used because the already limited inputs were to be divided among several crops now. This and limited irrigation capacity inhibited further growth of crop cultivation.

Dynamism in Agriculture
With the breakthrough in productivity in rice and some other crops and considerable success in crop diversification, the rate of adoption of the HYVs and associated practices by farmers increased. This created a dynamic period for the first time in the post-independence Burma. When compared it with such a similar dynamic period created during the colonial rule, the former period was caused by the external factors especially foreign trade whereas the latter dynamic period was caused by the internal factors in terms of technological and productivity breakthroughs. From growth point of view, the desirability of technology-related dynamism is unquestionable because rapid economic growth which is imperative in any developing countries will 'require a large increase in the productivity of resources used by the farmers' (Myrdal 1968). Unfortunately, the dynamism created in Burma was distorted before it was established in a built-in process. Nevertheless, the experiences it gained are relevant for future development of Burmese agriculture.

Changes in Agrarian Structure and Institution

Land Reforms
When Burma gained independence in 1948, the agrarian situation was one of low-yielding small holder production with primitive technology. Production was concentrated in private hands and was dominated by small-holdings. Almost half of the total cultivated land area was owned by the non-agriculturists or absentee-landlords who were disinterested in investment for land improvement activities. Their main function has been renting out the land and collecting land-rent which was increasing over time as competetion for land by the increasing number of landless farmers became keen. Land reform therefore was understandably an important issue when Burma gained independence. Policies and plans of post-Independence Burma therefore centred on abolishing landlords by resuming their land and redistributing it to the landless farmers. The policy was implemented follwing the enactment of the 'Land Nationalisation Act of 1953' by which all lands owned by non-agriculturists, all land owned by the agriculturists in excess of 50 acres (i.e., about 21 hectares), and tenanted land in excess of 'one yoke area' (i.e., about 10 acres or 4 hectares) were to be resumed by the state and redistributed to the landless farmers. However, the work was abandoned in 1957-58 due to a variety of problems encountered. Between 1953-54 and 1957-58, an area of 1.4 million acres (i.e., 0.58 million hectares) of cultivated land was nationalised and redistributed which was only about 15 per cent of the intended target (HSTC, 1966, p.84).

After 1962, a number of Tenancy Laws were enacted and liberal land reform measures were undertaken by the government. The 'Tenancy Law of 1963' empowered the newly formed 'Land Committees' instead of the private land owners the right to tenant the land, the 'Farmers' Right Protection Law of 1963' fully protected the rights of the farmers including prohibition by law of confiscating the means of cultivation of the farmers by the landlords or money lenders on account of the outstanding debts. Finally the 'Land Tenancy Law Amendment Law of 1965' totally abolished the private tenancy rents. It was estimated that a total of 7 million acres (i.e., 2.9 million hectares) of land was now freed from paying rent which amounted to K.70 million. The amount saved or benefited by a farmer of 10-acre (i.e., 4.2 ha.) holding was estimated at K.84 due to the above laws and measures (HSTC 1966, pp. 100-2). Since 1963 until now, the state is the sole owner of all cultivated land, and farmers are the state tenants . The farmers have the cultivation rights only. These rights can be passed on to children if they remain as farmers but they have no rights of sale, mortgage, divisions, and/or transfer of the land to others. Only state bodies have the power to transfer the land.

Agricultural Indebtedness and Provision of Loans
Burmese farmers were free of debt until the advent of agricultural commercialisation in the 1870's under the colonial policy. For centuries they operated under the self-sufficient barter system of economy. Thus they had little working capital especially cash when the process of commercialisation of agriculture began. Because the colonial administration had not arranged

for the provision of agricultural loans to the farmers, the only alternative source of acquiring it by the farmers had been the private money lenders, especially the *Chettiars* . The absence of any systematic financial institution and laws regulating the activities of private money lenders had left the farming population at the mercy of them. The money lenders exploited the farmers using extraordinarily high interest rates and other unscrupulous means. Hence, for the first time in Burmese history, indebtedness of the farmers became a major problem which has persisted until the present[10]. Solving this problem therefore was given high priority in all the policies and plans of the governments in post-independence Burma[11].

The seasonal agricultural loans are by far the most important of all forms of the financial assistance needed by the majority of farmers in Burma. The estimated requirement of such loans in 1953-54 was K 350 million of which only K 55 million (or about 16 per cent of the requirement) was given by the government. (Aye-Hlaing 1957, pp. 14-7). Until 1960-61, the maximum amount of seasonal loans given by the government in any year was K. 87 million which met only about 25 per cent of the requirements. The private sources of credit have therefore persisted as the major sources of credit for the farmers. The average rate of interest for the government loans was 7 per cent as against 48 per cent for the private cash loans and 60 per cent for private loans in cash and in kind (Aye-Hlaing 1956, p.17). After 1962-63, the rate increased to 12 per cent for government loans and varied between 60 to 100 per cent for (illegal) private loans. The problem of indebtedness persisted and was severe in parts of the major agricultural regions until 1962-63. For example, a survey in Pegu District in 1960 indicated that 86 per cent of the farmers was in debt. Each household on average borrowed about K.660 p.a. (i.e., K. 61 per acre) and the estimated amount of debt per farming household in 1960-61 ranged between K. 100 and K. 400 p.a.(Hla-Than 1961as cited in Mya-Than 1979, p. 34).

Being aware of the severity of the problem, the Revolutionary Government increased the volume of loans from K.175.7 million in 1961-62 to K.385 million in 1962-63. The loans remained above the 300 million levels until 1964-65. The amount of per acre loans for rice was also raised from a previous K.8 to K.12 in 1962, to K.25 in 1963, and further to K.70 in 1977-78 respectively. Beginning from 1979-80, while the loan for ordinary local varieties remained at K.70 per acre, it was raised to K.140 for the HYVs on account of more cost incurrence for cultivation of them. The coverage of loans was extended to include several other industrial and oil-seed crops such as jute, cotton, sugar-cane, and groundnut. Repayment of all short term loans by the rice farmers are not in cash but in kind (i.e., in paddy) the amount of which are added to the compulsory quota to be delivered to the state after harvest (Aung-Myint 1987, p.19).

Investment Allocation and Financing Investment

The contribution of agricultural sector to the GDP during the post-independence era was about 40 per cent. Proceeds from rice export alone was K.1019 million in 1952-53 which was more than half of total export earnings. Although the volume of proceeds from rice export declined in later years, its share in the total export earnings never fell below 40 per cent level throughout the period until 1980-81. Moreover, rice occupies half the cultivated area and employs about 70 per cent of the labour force. Despite such an important role played by the agricultural sector, the agricultural sector has been consistently taxed heavily to realise the government policy of moving resources out of agriculture to finance national economic development. It was taxed in two ways. The first is a direct tax in the form of rental and the second, an indirect tax in terms of the price differentials between the export price and the local farm price. When the direct tax (land rent) was reduced by the government after 1964-65, the indirect tax

---

[10]For further information on the causes and severity of the problems of agricultural indebtedness during colonial rule in Burma, see, among others, Furnival (1957), op. cit., and U Aye Hlaing (1965), op. cit, respectively.

[11]With the establishment of the Agricultural and Rural Development Corporation (ARDC) in 1952 and the State Agricultural Bank (SAB) in 1953 as an integral part of the Eight-Year *Pyidawtha* Plan (1952-60), the government took the initiative to develop a finacial and credit system to solve the indebtedness problem and finance the development of the agricultural sector.

increased to contribute 50 to 70 per cent of the total export earnings during the period between 1951-52 to 1987-88 (Hill and Jayasuriya 1986).

Despite such a remarkable contribution, allocation of capital expenditure to the agricultural sector was modest in that it received only about 9 per cent of the total government expenditure during the period between 1952-53 and 1959-60. It increased in later years especially in the late 1970's with the massive introduction of the HYVs. The main source of fund has been external borrowing. The emphasis on investment and growth has prompted the government to initiate policy revisions especially with regard to foreign aid and external borrowing. This marked the beginning of a substantial increase in external assistance and borrowings which increased fivefold between 1976 and 1980[12]. Of the public sector investment in 1983, 40 per cent was externally funded.(Hill and Jayasuriya 1986, p.27). Even then, the allocation of expenditure to agriculture never surpassed the 12 per cent of the total expenditure mark as against 45 to 50 per cent of investment in social and administrative sector. When foreign aids and loans declined after 1984-85, agricultural investment was cut again to the previous levels. The agricultural sector in Burma therefore obviously did not receive necessary government investment. As a contrast, the figure for the same investment in neighbouring Southeast Asian countries was 20 to 30 per cent of total capital expenditure.

Price Policies

The main aims of the official price system has been to: (a) maintain fair prices for both producers and the consumers; (b) efficient allocation of the available resources; and (c) control the rate of inflation. Accordingly, the main objectives of rice price policies which dominate the national economy are to: (a) guarantee minimum prices to growers while keeping retail prices low in order to maintain low costs of living; (b) ensure a given pattern of income distribution and to provide a certain level of public revenue; (c) act as a principal means of taxing the farm sector; and (d) to derive substantial revenue from the export of surpluses by keeping the domestic procurement price low relative to export price (Tin-Soe and Fisher 1989a, pp.8-9).

As a general rule, for the purposes of price fixation, commodities are classified into four categories: (a) essential; (b) necessity; (c) semi-luxury; and (d) luxury. Profit margins are fixed depending on the category of the commodity at a maximum of 5 per cent for essential items, 7 to 10 per cent for necessity items, 15 to 20 per cent for semi-luxury items, and flexible rates (usually 200 to 300 per cent) for luxury items. The official procurement price of rice is fixed after taking account of the estimated cost of production.

The co-operatives are allowed to fix the prices of both their own produce and that of the commodities in which they can legally trade. However, there is some regulation of the retail price of certain commodities such as rice. Profit margins are allowed to vary across regions depending on local conditions and overhead costs.

In the private sector prices are set by the market mechanism. It should be noted that prices prevailing in neighbouring countries have a major influence on prices within Burma because of the extent of smuggling. This private illegal foreign trade was estimated at about $US 70 million during the decade ending in 1975 (IBRD: *Report* 1975, p. 21) which increased to over $200 million a year after 1980 (Hill and Jayasuriya 1986, p.32). This trade has, no doubt,

---

[12]Since the effort to raise domestic savings were not adequate to finance the required level of investment, the previous policy of self-reliance was relaxed and seek for foreign aids and concessionary loans from external sources. This marked the beginning of a substantial increase in external assistance and borrowings. Between 1972 and 1975, aids and loans worth of $ 378 million came from from Western countries, primarily from Japan and West Germany. Burma joined the Asian Development Bank in 1973, and, in 1976, the Burma Aid Consultative Group was formed. In 1976, 14 percent of gross domestic capital formation came from foreign sources which increased to 37 per cent in 1982 but declined to 26 per cent in 1983. During the period between 1970 and 1983, for example, foreign saving increased more than 10 times from K. 277 million in 1970 to K. 2837 millions in 1983 while the shares of foreign saving in gross domestic capital formation increased from 23 per cent to 26 per cent during the same period. The highest share of foreign saving were recorded in the years 1978, 1979, 1980, and 1982, the figure being 37 per cent each year (Hill and Jayasuriya 1986, p.26).

expanded rapidly since official foreign trade has declined while the domestic market has expanded. With regard to the relative share of the private sector in the domestic trade, the official estimate was that about 70 per cent of the gross output enter into private and co-operative trade (MNPF: *Report* 1986, p.4). Since the share of co-operatives either in production or trade is insignificant, it is the private sector that is dominant in the Burmese economy.

The official procurement prices are low when compared either with free market prices or with export prices (Table 6). The government procurement price of paddy (Ordinary Ngasein Variety) was fixed at K137 per ton in 1948 which remained constant until 1958. During the 1958-60 period, the then caretaker government introduced a range of K137-149 per ton for various qualities of rice and delivery dates. Since that date there have been modest increases for ordinary grades and more generous ones for superior qualities. Beginning from 1980-81, the price was raised to K478 per ton and remained unchanged until 1986-87. Until 1962-63, free domestic trade prevailed, and farmers were free in their choice of crops grown and marketed. Beginning in 1963-64, all activities of production, milling, transportation and marketing of crops especially rice was controlled by the government[13]. The public and co-operative trading agencies supplied inputs and consumer goods at low fixed prices but it met only about one-thirds of the requirements. The farmers have to depend entirely on illegal black market for their remaining needs.

Problems

Any economic analyst tackling the problems of agricultural development in Burma cannot escape but conclude that the government policy is the main source of all the problems of which some relevant ones are briefly discussed below.

Conflicting Policy Objectives

Growth vs. Welfare

One major characteristic of the government policies in Burma was its concurrent emphasis on both growth and equity of the society from the onset when development was non-existent. A short-run emphasis on equity of price policy especially after 1962 without a high rate of growth in the economy impeded growth and thus providing equity and stability soon became a big problem. To meet the equity needs, growth must be associated with a rapid increase in the supply of food and demand for labour. Since the poor are substantially deficient in food, their marginal propensity to spend for it is high, and it is only through increased demand for labour that they can earn additional income to purchase food and other basic necessities.(Mellor and Ahmed 1988, pp. 265-66) However, the modest investment in agricultural sector failed to create effective demand for labour and for food. Combined with other factors, the result has been out-migration of rural labour to the already problematic urban sector which negatively effected both sectors, a typical case with the developing countries.

Maximisation of Yield vs. Profit Maximisation

The conflicting nature of objectives at different levels of society were also apparent. With regard to production, the official policy objective aims at maximising yield but profit maximisation is the farmers' objective. To achieve this end, the government understandably adopted the policies of yield-raising measures. However, high yields with less profits due to higher costs and more work was not attractive to the farmers. It appears that little effort have been made by the policy makers to reconcile this conflict. It was not a matter of great concern until 1962-63 when costs were still low and cultivation was still profitable. However, when costs increased faster than income since late 1960's, this conflict of interest became a problem of considerable proportion.

---

[13]Sown areas in Burma after 1962-63 were classified into two broad categories: 'planned' (or 'controlled') and 'non-planned' (or 'non-controlled'). In the first instance, 67 crop types were brought under control which was reduced to 19 after 1965 due to management and other problems. Areas of 'planned' crops are strictly controlled and supervised. Priority for the provision of inputs, extension services and loans was given to farmers growing planned crops. In return, farmers, especially rice farmers, must deliver a fixed quota to the government at a fixed price. The two main criteria of determining the quota of rice to be delivered are area sown and yield.

Means vs. Ends
The policy objective of protecting small farmers by the government's price-stabilisation scheme in terms of minimum guranteed price also back-fired. The scheme destablised incomes of small farmers because they could sell only a small proportion of their produce. Instead, it stablised the incomes of the large farmers who sell most of their produce. The extent of income destablisation depends on the price elasticities of demand and the proportion of production marketed (Mellor and Ahmed 1988, p.266). The extent of this effect in Burma is not known since no systematic research has been conducted on the demand for agricultural products. The government, instead of taking measures to solve the problem, has imposed restrictions such as maximum limit of tilling size of land. The consequences were disastrous effects on production and yields resulting from land fragmentation and degradation, and lack of incentives to undertake land improvement activities by farmers.

Land Reforms and Tenancy Problems
Contrary to the initial objectives of the land reforms, the non-agriculturist land ownership had increased by 1 per cent from 1957-58 to 1960-61 (BSPP, 1970, pp.187-8) and in 1962, 30 per cent of the land was under share tenancy (Hill and Jayasuriya 1986, p.39). The land reform measures also failed to benefit the poor small farmers (Mya-Than 1979, p.33). It was alledged by the later socialist governmnet that the real aim of the then land reforms of the AFPFL government[14] was to create a new small land owning class and a new stratum of rich farmers rather than to implement the policy of 'land to the tillers' (BSPP, 1970, p.188). Despite many short-comings in the land reform of the 1950's, some positive aspects could also be observed. The agrararian structure has changed considerably following the departure of foreign landlords during the War and with the nationalisation of land. The proportion of the tenanted land declined from 50 per cent during the prewar time to 30 per cent in 1961-62. Many of the tenant-farmers working on the *Chettiars'* land became land owners following the flight of *Chettiars* (Mya-Than 1979, p.33). If this new development could have been adjusted by policy reforms to suit the realities of economic environment of Burmese agriculture, it could have contributed to growth of the sector in the long-run. The extreme measures after 1962 have disrupted whatever gains achieved by the earlier land reforms and distorted the agrarian relations.

With a long-term persepective, taking into account of its consequences on production, yield, and land improvement activities, the land reforms after 1962 have failed. Neither tenancy nor land transfers have completely disappeared (Saito 1981), and tenancy and associated problems persisted (Mya-Than 1979, Tin-Soe and Fisher 1989a). The motivation of undertaking land improvement activities by the farmers was severely reduced which have led to land degradation, with deterioration in yields. Division of land among inheriting children further reduced the size of holding to uneconomic sizes. For example, for Burma as a whole, the proportion of farms under 2 ha comprised only 6 per cent of total sown area in 1953-54 which increased to 25 per cent in 1986-87 (CSO: *Yearbook* 1965 and MNPF: *Report* 1988). Although farm wages increased twice compared with that of the pre-War level, general price level had increased about 6 time during the same period so that the standard of living deteriorated. This and other factors[15] encouraged many farm labourers to migrate to the urban areas which began to cause the labour shortage in the farming sector especially during the peak season and increase cost of cultivation (Mya-Than 1979, p.34).

Problems of Agricultural Loans and Finance
Major problems with regard to agricultural loans in Burma were the non-repayment of loans by the farmers, and disbursement and recollection of loans by the government agencies efficiently. The loans outstanding among the farmerers increased so rapidly that the funds for new loans dried up in 1965-66, only 3 years after 'easy loans' were made available by the government. Consequently, the amount of new loans decreased after 1965-66 to a level of around K 100

[14]Anti-Fascist, People's Freedom League (AFPFL) was the main political force since the time of struggle for Burma's independence from Britain and remained as the major force after independence until 1961-62.

[15] Other factors include rural unrest and insecurity, job instability in the rural sector, and better job orportunities in the urban sector.

million which, even by the official estimates, was less than one thirds of total requirements. The farmers' dependence on the 'illegal' private money lenders has therefore increased, and the problem of indebtedness has persisted.

It should be noted that the attempts to solve the problem of agricultural loans in Burma by the governments hitherto have emphasised giving sufficient amount of loans needed by the farmers rather than improving the efficiency in allocation, management and use of loans. Experiences have shown that under both the open and closed economy periods, the major problems with regard to issuing loans has been the organisational and management in nature. The administrative methods used by the government in the management of loans proved inefficient and ineffective. Although loan recovery rate was high in the 'collective responsibility system' (*wainggyichoke sanit*) used by the government as the main weapon for securing higher rate of repayment, it involves some compulsion which frequently creates socio-political tension and administrative problems.

Even without repayment problems, it is virtually impossible for governments to supply all the loan funds needed by farmers in a country such as Burma where the farming population comprises about 80 per cent of total population, and the financial resources of the country are extremely limited. This suggests that the objectives, means and management of loans should be reconsidered. Past experience showed that tieing up the loans to both growth and welfare purposes failed to realise both objectives. At the low level of development when financial resources are scarce and limited, it could not cope for both purposes effectively. Raising efficiency in allocation and use of loans should be the objectives, and a balance between yield maximisation and profit maximisation should be the criteria. Loans enable producers to invest in productive activities that will increase their profits. The investment process will increase economic efficiency and growth, and ultimately the welfare of all individual in the society. The main issue is how to allocate loans efficiently. The most efficient loans allocation method is via a competitive market. In a developing country this may connote a combination of government and private lenders with government specifically providing competitive or filling market gaps.

Problems of Finance and Allocation of Investment

For Burma, the export tax or indirect tax is one of the most important sources of revenue for investment funds. In the early 1950s sales of rice for domestic use (excluding farmers' re-purchases of milled rice) was estimated to about one-third of total rice production so that the remaining two thirds were available for export. The share taken by the domestic market has been gradually rising and exceeded that of exports in 1966-68. Domestic consumption was stimulated after 1964 when retail prices of rice were equalised throughout the Union, regardless of the overhead costs, at levels prevailing in the delta. This policy was said to have cost the state some K70m in subsidies in 1964-65, (*The Guardian*, June 23, 1965), K 96m in 1980-81, K 392m in 1986-87, and K 151m in 1988-89 respectively (*The Loketha* July 14, 1989). To the extent that it succeeds in holding down retail prices by subsidy or by diverting export supplies for local sale, it transfers income to urban consumers and reduces both farmers' and state resources for investment and the country's foreign exchange earnings. Because of the rigid government policies, private sources were unable to fill this vacuum of investment. The government later financed investment by external borrowing but misallocation or allocation of funds inefficiently created the problem worse. The increasing debt servicing ratio deprived of whatever gains accrued from such investment. Under the circumstances, allowing the competitive market to allocate loans and investment with minimum level of government regulations seems the only best alternative to raise efficiency and growth.

Price Policies and Problems

Despite low official procurement prices, the agricultural production especially rice has been still a profitable farm enterprise until 1962 due to low cost of cultivation and other favourable conditions for the farmers. However, the government's administered prices after 1962-63 which failed to reflect the actual cost of cultivation have led to the distortion of prices and market since 1965-66. The formula for the compulsory delivery quota was fixed in such a way that an increase in yield per hectare and/or in farm size is accompanied by a progressive rate of increase in the amount of the quota after a threshold is reached (Table 7).

Consequently, contrary to the initial objectives of raising yields and expansion of production, the compulsory delivery formula has reduced the incentive to expand size or raise yield per unit of land by the farmers. Low official procurement price, high indirect tax, repayment of the government cash loans in paddy which (i.e., the cash equivalent of paddy) is calculated at the official price, and shortcomings in the compulsory delivery formula caused the illegal black market to flourish which further reduced farmers' real incomes.

The taxation of the export crop under the overvalued exchange rate, instead of providing government revenues, has created the additional price-depressing effect which drove returns below alternative uses of resources and caused a major supply effect since 1964-65. To use the overvalued exchange rate as one of the common devices for maintaining a low consumer price also is a way of penalising agriculture (Mellor and Ahmed 1988, p. 273). Experiences of other countries indicate that pro-agriculture policy usually requires devaluation of overvalued currencies. Last but not least, the evidence suggests that five major public policy issues that the price policy must face associated with technological change were not well perceived by the policy makers in Burma beforehand[16]. Price policy has pulled resources from export commodity production and slowed growth in both farm production (supply) and depressed food demand. Decline in major agricultural exports especially rice, and consequent scarcity of foreign exchange in turn depressed both food production and consumption and demand for labour. Eventually the resultant inefficiencies, corruptions, retarded growth, rapid increase in food prices and distorted market intensified the problems to unmanageable proportions.

Future Prospects

There are good prospects for growth of Burmese agriculture in the future. Physical, natural and economic environments and factor endowments of Burmese agriculture are very favourable to growth. The cultivable lands are abundant and the soil of the land is most suitable for cultivation of a wide range of crops (MAF 1982). The farmers are generally highly responsive to the price and markets signals and to other innovations and incentives which can benefit them. A considerable pool of well trained and experienced extension workers and agronomists are readily available. Efficient policies and management system are needed to mobilise and use these factors effectively and productively. Future prospects of agricultural growth therefore depends on how effectively such a policy and management system could be developed.

As the historical experience has shown, production gains in the future will require higher investment levels on the one hand and efficient allocation and effective use of the funds on the other hand. Better prospects of agriculture may not be realised unless the extent of crop diversification and export potential could be enhanced rather quickly. The HYV programmes as a strategy is conducive for that purpose but on conditions that fundamental policy and structural reforms were undertaken, recognising the proper role of private sector and competitive market.

References

Aung Myint (1987), 'Government Procurement Price Changes and Its Impact on Rice Production in Burma', A Master of Arts in Development Studies Degree thesis, Institute of Social Studies, The Hague, The Netherlands

[16]These issues, briefly, are that. (1) Increased instability in agricultural production, prices, and incomes tend to accompany accelerated technological change in agriculture and places growing pressures on political systems to respond; (2) Technological change may cause a downward price trend over several years which, no doubt, is a virtue that need no attempt to prevent such declines; (3) Technological change causes increased dependence of farmers on purchased inputs, and encounter the many obstacles to spreading input use since it requires to subsidise not only the inputs alone but also the distributional channels to achieve rapid expansion and a public sector investment in storage; (4) Government expenditure in agriculture must grow immensely to support accelerated technological change that public policy with respect to price stabilisation, price support, and input subsidies must all be abandoned or reduced eventually; and (5) The technological change in agriculture may also bring a deleterious effect on some of the poor through it effects on nonparticipating regions and through increased instability (For further information, see Tin-Soe and Fisher 1989b).

Aye Hlaing, U (1965),'Trends of Economic Growth of Burma: 1870-1940'. (mimeograph), Institute of Economics, Rangoon.
Burma Socialist Programme Party (1970), *'Burmese Agrarian History*, Rangoon, Burma
Central Statistical Organisation, *Statistical Year Book* 1961 and 1975 issues, Rangoon.
-----, *Selected Monthly Economic Indicators* (various issues), Rangoon.
Furnivall, J.S (1957), *An Introduction to the political Economy of Burma*, (3rd edition), People's Literature House, Rangoon.
High School Textbook Committee (1966), *'Myanmar Seebwaye Achebya'*, Rangoon.
Hill, H and S.K.Jayasuriya (1986), *An Inward-Looking Economy In Transition --Economic Development in Burma since the 1960s*, Occasional Paper No. 80, Institute of Southeast Asian Studies, Singapore.
Hla Tun,U, Daw Khin Lay and U Tin Soe (1985), 'An Analysis of Rice Distribution and Marketing Activities in Burma' , (Mimeograph), 1985, Rangoon.
Institute of Economics (1980), 'Taikgyi Township Rural Survey 1980', (Mimeograph), Rangoon.
-----,(1982), 'Hlegu Township Rural Survey 1981-82', (Mimeograph), Rangoon, Burma.
Kan Zaw (1984), 'Agricultural Growth and Regional Development: A Case Study in Irraw ddy Delta, Burma', A Master of Development Studies Degree thesis, Institute of Social Studies, The Hague, The Netherlands.
Khin Win, Nyi Nyi and E.C. Price (1981), *The Impact of a Special High Yielding Rice Program.* IRRI Research Paper Series no. 58, The International Rice Research Institute, Los Banos, Philippines.
Lintner, Betrtil (1989), 'The Busy Border', *Far Eastern Economic Review* (8 June 198
Mellor, John W, and Raisuddin Ahmed (1988)' 'Conclusions - Agricultural Price Policy for Accelerating Growth' in John W.Mellor and Raisuddin Ahmed (ed.), *Agricultural price policy for developing countries*, The John Hopkins University Press, Baltimore.
Ministry of Agriculture and Forests (1987), *Notes on Agriculture in Burma*, Rangoon.
Min.of National Planning(1973), 'An Outline of The Directives for the Twenty-Year Plan', (Mimeograph), Rangoon.
-----, (1984), 'Planning Procedure in Burma', and 'Pricing System in Burma', (mimeographs), Rangoon.
-----, *Report to the Revolutionary Council on the Financial, Economic and Social Conditions of the Socialist Republic of the Union of Burma* , and *Report to the Pyithu Hluttaw*, Rangoon (various issues).
-----, *Economic Survey of Burma* , Rangoon (various issues from 1948 to 1964)
Mya Than (1975), *'A Review on the Impact of Raising Paddy Prices'* (mimeograph in Burmese), Research Department, Institute of Economics, Rangoon.
-----, (1980), 'Agricultural Development in Burma', A paper presented to the UNITAR Conference, New Delhi, 1980.
-----, (1988), *Growth Pattern of Burmese Agriculture: A Productivity Approach*, Occasional Paper No. 81, Institute of Southeast Asian Studies, Singapore
Richter, H.V (1973), 'The High Yield Program in Burma' in *Technical Change in Asian Agriculture* (ed.) R.T Shand, Australian National University Press, Canberra.
-----, (1976), *Burma's Rice Surpluses: Accounting for the Decline.* Occasional Paper, No.3. Development Studies Centre, Australian National University, Canberra.
Saito, T (1981), ' Farm Household Economy Under Paddy Delivery System in Contemporary Burma', *The Developing Economies*, Vol.19, no. 4 (1981) 367-97.
Steinberg, D.I (1981), *Burma's Road Towards Development: Growth and Ideology Under Military Rule*, Westview Press, Boulder.
The Guardian Daily (June 23, 1965), Rangoon, Burma.
The Loketha Pyithu Daily (July 14, 27 and various issues of Jul. and Aug.1989), Rangoon, Burma.
Tin Soe, U, and U Zaw Pe Win (1970), 'Analysis of the Effectiveness of Agricultural Policies in Burma' (in Burmese), A research paper presented to the Fifth Burma Research Congress, Rangoon, 1970.
Tin Soe (1976), 'Adoption of Improved Agricultural Technology: A Case Study for Shwebo Township', M.A.Degree thesis, Dept. of Economics, University of Rangoon, Rangoon.
-----, (1979),' Agricultural Development of Burma: 1855-1975 - A total Productivity Approach' A paper (in Japanese) presented to the TEA Winter Conference, Obihiro University, Hokkaido, Japan, June, 1979.
-----, (1982), 'Rice Price Policy: A Comparative Analysis of Burma and Some Asian Countries' (Mimeograph in Burmese), Rangoon.
Tin Soe, U and Brian.S.Fisher (1989a), 'Burmese Rice Price Policies - An Economic Analysis of Developments since Independence', A contributed paper presented to the 33rd Annual Conference of the Australian Agricultural Economics Society, Christchurch, New Zealand, 6-9 February, 1989
-----, (1989b), The revised and updated version of the paper under the same title accepted for publication in the forth-coming book, entitled, *'BURMESE DILEMMAS AND OPTIONS: The Challenges of Economic Transition in the 1990s'* to be published in March, 1990, by the Institute of South East Asian Studies, Singapore.
Yamada, S.(1975) *A Comparative Analysis of Asian Agricultural Productivities and Growth Patterns.* Productivity Series 10, Tokyo: Asian Productivity Organisation.

Table 1. Total Agricultural Net Output in Burma; 1947/48-1987/88

Year	Net Output (Million Kyats)	Output Index (61/62=100)	Change in output index	Yearly growth rate (%)
1947-48	1835	73	-	-
1948-49	1916	76	3	4.4
1949-50	1754	70	-6	-8.5
1950-51	1962	78	8	11.9
1951-52	2015	80	2	2.7
1952-53	2093	83	3	3.9
1953-54	2058	82	-1	-1.7
1954-55	1980	79	-3	-3.8
1955-56	2036	81	2	2.8
1956-57	2090	83	2	2.7
1957-58	1926	77	-7	-7.8
1958-59	2295	91	15	19.2
1959-60	2372	94	3	3.4
1960-61	2340	93	-1	-1.3
1961-62	2511	100	7	7.3
1962-63	3007	120	20	19.8
1963-64	2930	117	-3	-2.6
1964-65	3145	125	9	7.3
1965-66	2929	117	-9	-6.9
1966-67	2665	106	-11	-9.0
1967-68	3107	124	18	16.6
1968-69	3189	127	3	2.6
1969-70	3276	130	3	2.7
1970-71	3476	138	8	6.1
1971-72	3545	141	3	2.0
1972-73	3291	131	-10	-7.2
1973-74	3619	144	13	10.0
1974-75	3565	142	-2	-1.5
1975-76	3728	148	6	4.6
1976-77	3897	155	7	4.5
1977-78	4081	163	7	4.7
1978-79	4346	173	11	6.5
1979-80	4516	180	7	3.9
1980-81	5060	202	22	12.0
1981-82	5500	219	18	8.7
1982-83	5805	231	12	5.5
1983-84	6090	243	11	4.9
1984-85	6302	251	8	3.5
1985-86	6465	257	6	2.6
1986-87*	6541	260	3	1.2
1987-88**	6476	258	-3	-1.0

Average annual grwoth rate (%) between

1947/48	and	1956/57	1.39
1957/58	and	1966/67	3.84
1967/68	and	1976/77	2.54
1977/78	and	1987/88	5.87
1947/48	and	1961/62	2.46
1962/63	and	1987/88	4.44
1947/48	and	1987/88	3.41

Source: Data sources for calculations include:
1. CSO: Statistical Yearbook (196*, 1965 & 1975 Issues);
2. MNPF: Report to The 'Pyithu Hluttaw'...(various issues);
3. MFR: Economic Survey of Burma (various Issues from 1953 to 1964.
(CSO=Central Statistical Organisation; MNPF= Ministry of National Planning and Finance; and MFR= Ministry of Finance &Revenue, respectively).
*provisional actual **provisional

TABLE 2(A): FIXED AGRICULTURAL INPUTS, BURMA; 1947/48-87/88.

YEAR	INDICES (1961/62=100) Labour force	Area under various crops	Net sown area	State capital exp: (SCE)	OF value of total fixed capital	SCE /Ha. (K)	SCE /Lbr (K)	Oxen ('000 heads)	Buffalo ('000 heads)	Harrow ('000 units.)	Plough ('000 units.)	Cart ('000 units.)	Fixed capital /land (K/Ha)	Fixed capital /labour (K/Lb)	Tractor agr.land (No. per '000Ha
1947-48	79	79	79	5	83	0.76	0.95	3277	571	1055	n.a	601	496	621	n.a
1948-49	79	81	82	3	84	0.50	0.63	3741	659	1135	n.a	647	488	623	n.a
1949-50	81	77	78	4	75	0.62	0.74	4010	569	1112	n.a	715	461	551	n.a
1950-51	82	78	79	7	151	1.02	1.21	4456	743	1115	965	734	915	1084	n.a
1951-52	83	80	81	6	154	0.86	1.03	4564	766	1138	989	744	915	1094	n.a
1952-53	85	83	84	19	157	2.75	3.37	4633	793	1180	1022	755	896	1097	n.a
1953-54	86	85	86	119	164	16.45	20.26	4731	837	1390	1042	768	913	1124	n.a
1954-55	88	83	84	7	160	1.01	1.20	4758	750	1350	1064	779	908	1080	n.a
1955-56	89	85	86	40	164	5.48	6.53	4799	854	1331	1071	782	913	1089	n.a
1956-57	91	85	86	48	166	6.68	7.82	4838	879	1367	1104	794	924	1082	n.a
1957-58	93	84	84	67	170	9.40	10.64	4891	940	1389	1128	808	958	1084	n.a
1958-59	94	87	88	67	175	9.12	10.48	5048	961	1457	1184	844	957	1099	0.06
1959-60	96	89	89	73	183	9.66	11.23	5254	1005	1476	1243	870	966	1122	0.06
1960-61	98	90	90	61	183	7.90	9.09	5252	1048	1497	1264	888	960	1106	0.05
1961-62	100	100	100	100	100	11.76	14.69	5190	1030	1436	1194	891	473	591	0.25
1962-63	102	109	107	82	108	8.91	11.87	5219	1047	1571	1550	905	467	622	0.28
1963-64	104	113	111	65	116	6.75	9.17	5204	1047	1785	1609	1059	486	661	0.39
1964-65	106	114	111	165	126	17.00	22.78	5240	1062	1863	1756	942	523	701	0.39
1965-66	108	114	110	73	123	7.56	9.95	5296	1083	1834	1718	1110	512	674	0.52
1966-67	102	112	109	94	154	9.88	13.55	5150	1001	1895	1814	1163	647	887	0.62
1967-68	107	112	107	72	166	7.49	9.85	5326	1064	1943	1890	1216	700	920	0.79
1968-69	118	114	109	60	168	6.21	7.53	5108	1047	1973	1931	1229	695	843	0.75
1969-70	118	114	109	53	178	5.50	6.65	5187	1063	2008	1964	1253	736	891	0.71
1970-71	120	117	110	35	181	3.47	4.23	5270	1093	2088	2063	1270	730	889	0.71
1971-72	123	119	111	76	184	7.52	9.13	5371	1129	2081	2054	1276	728	884	0.68
1972-73	125	118	110	62	186	6.16	7.24	5468	1153	2149	2080	1306	745	877	0.69
1973-74	127	122	113	25	208	2.44	2.94	5522	1162	2128	2115	1311	804	968	0.41
1974-75	130	123	113	103	208	9.79	11.65	5499	1172	2393	1899	1331	798	950	0.76
1975-76	131	123	114	157	212	15.05	17.57	5669	1085	2424	1908	1358	817	954	0.81
1976-77	134	122	112	142	215	13.75	15.63	5501	693	2441	1944	1371	835	949	0.89
1977-78	136	124	113	410	242	38.87	44.27	5333	648	2477	1990	1395	923	1051	0.86
1978-79	138	128	115	332	250	30.49	35.25	5564	668	2565	2059	1433	921	1065	0.88
1979-80	141	123	112	596	263	57.15	61.99	5734	699	2618	2129	1450	1014	1100	0.98
1980-81	144	130	116	771	282	69.53	78.75	5950	719	2690	2178	1474	1022	1157	0.82
1981-82	147	132	117	939	293	83.60	94.10	6137	746	2624	2461	1503	1050	1182	0.81
1982-83	150	129	115	1110	329	101.41	109.03	6259	769	2683	2510	1527	1208	1299	0.88
1983-84	153	132	115	1119	334	99.72	107.73	6366	783	2724	2550	1547	1197	1293	0.97
1984-85	156	137	117	1080	351	92.91	101.88	6516	796	2780	2579	1567	1214	1331	0.96
1985-86	159	135	117	1045	358	91.09	96.71	6643	816	2790	2606	1568	1254	1331	0.98
1986-87	158	129	115	951	359	86.60	88.42	5708	942	3039	2645	1587	1316	1343	1.03
1987-88	160	131	113	993	368	89.42	90.97	5874	969	3065	2661	1602	1334	1357	1.02

Average annual growth rates of inputs (all in per cent)

Year	Labour force in agri.	Area under various crops	Net sown area	State capital exp:	SCE /Ha.	SCE /Lbr	Tractor	Drought Cattle and other farm implem Oxen	Buffalo	Harrow	Plough	Cart	Total fixed capital	Fixed capital /land (K/Ha)	Fixed capital /labour
47/48-87/88	1.59	1.30	1.21	43.59	41.56	41.36	20.32	1.49	1.42	2.60	2.57	2.34	4.42	3.25	2.86
47/48-56/57	1.47	0.82	0.81	116.23	112.53	112.81	n.a.	4.08	5.10	2.78	1.95	2.87	10.16	9.25	8.54
57/58-66/67	1.04	3.04	2.63	14.49	11.23	13.44	58.69	0.53	0.69	3.27	5.23	4.01	0.89	-1.58	0.09
67/68-76/77	2.32	0.82	0.43	32.77	31.87	30.05	0.06	0.35	-3.90	2.37	0.36	1.21	2.67	1.83	0.42
77/78-87/88	1.51	0.53	0.96	10.85	10.63	9.14	2.21	1.01	3.80	1.99	2.73	1.27	3.95	3.51	2.39

Source:MNP;'Report'(various issues); CSO;'Statistical Yearbook',1961,1965, and1975 issues;MAF;'Agr. Statistics' (various issues); and 'Season and Crop Reports' (various issues).

Note: The base year for the indices shown in the table is 1961-62

TABLE 2(B): CURRENT INPUTS

Year	State current exp: index	Fertiliser value (K.Mil)	consumption value index	consumption Kg./Ha.	Kg./Lbr	Total current exp:/Ha (K)	Total curr:exp: /Lbr (K)	Irriga- ted area (000ha	Irriga- tion ratio (%)	HYVs of rice sown area (000ha	% of net sown area	Cattle/ Net sown area ratio
1947-48	17	nil	nil	n	ni	2	2	537.0	9.5	nil	nil	0.635
1948-49	14	nil	nil	n	ni	2	2	545.5	9.3	nil	nil	0.704
1949-50	23	0.86	12	0.5	0.64	3	3	501.4	9.0	nil	nil	0.770
1950-51	27	0.73	10	0.4	0.42	3	4	513.2	9.1	nil	nil	0.867
1951-52	30	0.82	12	0.3	0.41	3	4	525.7	9.1	nil	nil	0.868
1952-53	36	0.89	13	0.3	0.40	4	5	541.5	9.0	nil	nil	0.849
1953-54	40	1 48	21	0.5	0.66	4	5	541.1	8.8	nil	nil	0.851
1954-55	45	2.91	41	0.8	0.95	5	6	491.3	8.2	nil	nil	0.858
1955-56	44	3.30	47	0.9	1.10	5	6	518.4	8.5	nil	nil	0.863
1956-57	63	8.60	121	2.4	2.77	8	9	540.3	8.8	nil	nil	0.872
g/r p.a. (%)	15.85	42.86		30.30	29.55	17.97	16.69	15.95				
1957-58	63	3.79	54	1.2	1.34	7	8	520.8	8.6	nil	nil	0.903
1958-59	59	2.11	30	0.7	0.82	6	7	525.7	8.4	nil	nil	0.900
1959-60	64	6.10	86	2.0	2.33	7	8	575.9	9.0	nil	nil	0.910
1960-61	61	3.91	55	2.1	2.40	7	8	541.5	8.4	nil	nil	0.906
1961-62	100	7.08	100	3.4	4.26	73	91	569.4	8.0	nil	nil	0.808
1962-63	112	6.81	96	2.4	3.18	343	457	625.3	8.1	nil	nil	0.748
1963-64	68	11.16	158	3.3	4.51	207	282	824.8	10.4	nil	nil	0.717
1964-65	95	12.35	174	3.3	4.45	220	294	850.3	10.7	nil	nil	0.719
1965-66	94	13.14	186	3.5	4.64	119	157	813.0	10.3	nil	nil	0.727
1966-67	126	14.46	204	3.0	4.06	206	283	838.5	10.8	nil	nil	0.711
g/r p.a. (%)	10.57	27.71		20.73	23.20	137.24	150.53	5.32				
1967-68	374	38.10	538	8.1	10.65	184	242	868.1	11.3	nil	nil	0.739
1968-69	371	23.02	325	4.7	5.72	188	228	844.6	10.8	nil	nil	0.700
1969-70	286	29.84	421	6.8	8.28	191	231	818.3	10.5	nil	nil	0.710
1970-71	350	16.94	239	4.3	5.18	219	267	838.9	10.6	598	7.6	0.704
1971-72	424	43.76	618	10.8	13.12	278	338	889.9	11.2	634	8.0	0.708
1972-73	496	49.24	695	12.7	14.92	552	649	889.5	11.3	762	9.7	0.730
1973-74	305	11.70	165	3.2	3.84	229	275	971.3	12.0	898	11.1	0.710
1974-75	588	53.42	755	10.9	12.98	300	357	976.1	12.0	1376	17.0	0.702
1975-76	735	65.77	929	12.7	14.87	236	276	982.6	12.1	1729	21.3	0.715
1976-77	912	56.09	792	12.0	13.70	873	992	938.1	11.7	1703	21.2	0.654
g/r p.a. (%)	14.03	40.63		31 53	29.86	36.46	33 89	0.86		17.35		
1977-78	1500	70.95	1002	14.2	16.21	1354	1542	980.2	12.1	1913	23.6	0.627
1978-79	1471	97.07	1371	19.5	22.53	1713	1981	1043.7	12.6	2531	30.7	0.632
1979-80	1500	120.37	1700	22.2	24.03	1305	1416	998.8	12.4	2947	36.6	0.682
1980-81	1985	150.21	2122	24.6	27.82	1381	1564	1072.9	12.9	3446	41.4	0.664
1981-82	2544	157.49	2224	26.8	30.18	1573	1771	1043.7	12.4	4170	49.6	0.677
1982-83	2721	201.70	2849	34.0	36.56	1509	1623	1010.5	12.3	3898	47.4	0.709
1983-84	2529	245.02	3461	40.0	43.25	2482	2681	1064.4	12.9	3794	45.9	0.704
1984-85	2426	222.02	3136	35.3	38.75	2119	2324	1085.4	13.0	3878	46.4	0.695
1985-86	2296	234.57	3313	37.8	40.14	1462	1553	1058.7	12.6	3805	45.4	0.718
1986-87	2604	192.56	2720	32.4	33.13	2449	2501	1078.5	13.1	3442	41.8	0.669
1987-88	2612	238.99	3376	39.8	40.49	1459	1485	1051.4	13.0	2882	35.7	0.681
g/r p.a. (%)	5.88	12.95		10.81	9.75	5.84	4.94	0.72		4.73		
Growth rates for the whole period (1947/48-87/88)	11.58	31.04		23.34	23.09	49.38	51.51	5.71		11.04		

Source: the same as Table 2a

* The base year for all indices shown in the table is 1961-62 # Cattle includes both oxen and water buffaloes

TABLE 3: PRODUCTIVITIES IN AGRICULTURE; BURMA; 1947-48 to 1987-88

Year	Labour Kyats	Productivity Index	Change	Land Kyats	Productivity Index	Change	Capital-Output Ratio	Ratio Index	Change	Total Ratio	Productivity Index	Index Chnage	Land-Labor Ratio
1947-48	379	93	-	303	93	-	1.64	114	-	1.02	102	-	1.25
1948-49	391	96	3	306	94	1	1.59	111	-3	1.05	105	3	1.28
1949-50	353	87	-9	295	90	-4	1.56	109	-2	0.99	99	-6	1.20
1950-51	388	95	9	327	100	10	2.80	195	86	0.82	82	-17	1.18
1951-52	392	96	1	328	101	0	2.79	195	-1	0.82	82	1	1.20
1952-53	401	98	2	327	100	0	2.73	191	0	0.84	84	2	1.22
1953-54	387	95	-3	315	97	-4	2.90	203	12	0.80	80	-4	1.23
1954-55	366	90	-5	308	95	-2	2.95	206	3	0.77	77	-3	1.19
1955-56	371	91	1	311	95	1	2.94	205	-1	0.78	78	1	1.19
1956-57	373	92	1	319	98	2	2.90	203	-3	0.79	79	1	1.17
Annual rate of chage(%)	-0.03			0.59			7.81			-2.41			-0.64
1957-58	338	83	-9	298	92	-6	3.21	224	22	0.71	71	-8	1.13
1958-59	395	97	14	344	105	14	2.77	194	-31	0.83	83	12	1.15
1959-60	400	98	1	345	106	0	2.80	196	2	0.83	83	0	1.16
1960-61	388	95	-3	337	103	-3	2.85	199	4	0.81	81	-2	1.15
1961-62	407	100	5	326	100	-3	1.43	100	-99	1.00	100	19	1.25
1962-63	478	117	17	359	110	10	1.29	90	-10	0.79	79	-21	1.33
1963-64	457	112	-5	336	103	-7	1.42	100	10	0.87	87	8	1.36
1964-65	481	118	6	359	110	7	1.43	100	1	0.89	89	2	1.34
1965-66	440	108	-10	334	102	-8	1.50	105	5	0.95	95	6	1.32
1966-67	422	104	-4	308	95	-8	2.06	144	39	0.73	73	-22	1.37
Annual rate of chage(%)	2.59			0.58			-1.75			1.33			1.99
1967-68	472	116	12	359	110	16	1.90	133	-11	0.84	84	11	1.31
1968-69	440	108	-8	362	111	1	1.87	131	-2	0.82	82	-2	1.21
1969-70	450	111	3	372	114	3	1.94	136	5	0.82	82	0	1.21
1970-71	469	115	4	385	118	4	1.86	130	-6	0.83	83	1	1.22
1971-72	469	115	0	386	118	0	1.85	129	-1	0.78	78	-5	1.21
1972-73	427	105	-10	363	111	-7	2.02	141	12	0.56	56	-22	1.18
1973-74	462	114	9	384	118	7	2.07	145	4	0.79	79	23	1.20
1974-75	446	110	-4	375	115	-3	2.13	149	4	0.71	71	-7	1.19
1975-76	461	113	4	395	121	6	2.07	145	-4	0.79	79	8	1.17
1976-77	472	116	3	416	127	6	2.01	141	-4	0.49	49	-29	1.14
Annual rate of chage(%)	0.13			1.53			0.61			-3.13			-1.41
1977-78	487	120	4	428	131	4	2.16	151	10	0.39	39	-11	1.14
1978-79	509	125	6	441	135	4	2.09	146	-5	0.34	34	-4	1.16
1979-80	519	128	2	479	147	12	2.12	148	2	0.43	43	9	1.08
1980-81	571	140	13	504	155	8	2.03	142	-6	0.44	44	1	1.13
1981-82	609	150	9	541	166	11	1.94	136	-6	0.43	43	-1	1.13
1982-83	630	155	5	586	180	14	2.06	144	9	0.46	46	3	1.08
1983-84	648	159	4	600	184	4	2.00	140	-5	0.34	34	-12	1.08
1984-85	657	161	2	599	184	0	2.03	142	2	0.38	38	4	1.10
1985-86	661	162	1	623	191	7	2.01	141	-1	0.50	50	12	1.06
1986-87	672	165	3	658	202	11	2.00	140	-1	0.37	37	-13	1.02
1987-88	655	161	-4	644	198	-4	2.07	145	5	0.50	50	14	1.02
Annual rate of chage(%)	2.78			3.85			-0.32			4.48			-0.98
Overall growth rate (%)	0.9			1.05			1.81			-1.72			-0.16

Table 4 Multiple Regression

(Dependent variable: Net agricultural output)

Variables BETWEEN	ESTIMATED COEFFICIENTS DURING THE PERIOD				
	1947/8 -87/8 (Whole period)	1947/8 -61/2 (Sub-period I)	1962/3 -87/8 (Sub-period II)	1962/3 -73/4 (Phase 2.1)	1974/5 -87/8 (Phase 2.2)
Labour productivity	1.027	0.592	0.563	- 0.344	1.436
(T-Statistic)	(3.113)	(1.029)	(1.965)	(-0.951)	(3.944)
Land productivity	0.795	1.361	1.123	1.596	0.525
(T-Statistic)	(3.566)	(2.616)	(5.927)	(7.443)	(2.255)
Capital-Output Ratio	- 0.135	- 0.477	0.197	0.060	0.218
(T-Statistic)	(-2.489)	(-3.387)	(2.348)	(0.841)	(0.673)
Total Productivity	-.0.451	- 1.953	-0.065	0.073	0.076
(T-Statistic)	(-4.135)	(-3.181)	(-0.869)	(0.574)	(0.884)
Constant	-25.574	145.43	-78.21	-23.68	-114.23
(T-Statistic)	(- 0.958)	(2.159)	(-3.308)	(-0.770)	(-1.933)
R^2	0.9855	0.8333	0.9945	0.9489	0.9960
R^2-adjusted	0.9839	0.7666	0.9935	0.9197	0.9942
d statistic	0.8524	0.9851	1.8463	0.9701	1.4954
F statistic	610.304	12.497	954.235	32.49	561.15

TABLE 5 Correlation Matrix

	Net Agri. Output	Labour Productivity	Land Productivity	Capital-Output Ratio	Total Productivity
1947/48-1987/88					
Net agri. output	1	.9847	.9800	.2905	.8235
Labour productivity	.9847	1	.9740	.3429	.7696
Land productivity	.9800	.9740	1	.1865	.8138
Capital-output Ratio	.2095	.3429	.1865	1	.0721
Total productivity	.8235	.7696	.8138	.0721	1
1947/48-1961/62					
Net agri. output	1	.6439	.7966	.1196	.1249
Labour productivity	.6439	1	.7429	.1982	.3048
Land productivity	.7966	.7429	1	.3429	.2579
Capital-output Ratio	.1196	.1982	.3429	1	.9784
Total productivity	.1249	.3048	.2579	.9784	1
1962/63-1987/88					
Net agri. output	1	.9774	.9960	.4481	.7899
Labour productivity	.9774	1	.9815	.2907	.7195
Land productivity	.9960	.9815	1	.4175	.7733
Capital-output Ratio	.4481	.2907	.4175	1	.6151
Total productivity	.7899	.7195	.7733	.6151	1
1962/63-1974/5					
Net agri. output	1	.3941	.9580	.3727	.1664
Labour productivity	.3941	1	.5486	.4436	.4424
Land productivity	.9580	.5486	1	.2313	.1044
Capital-output Ratio	.3727	.4436	.2313	1	.5467
Total productivity	.1664	.4424	.1044	.5467	1
1975/76-1987/88					
Net agri. output	1	.9957	.9939	.5694	.4919
Labour productivity	.9957	1	.9887	.6017	.5166
Land productivity	.9939	.9887	1	.5442	.4910
Capital-output Ratio	.5694	.6017	.5442	1	.2724
Total productivity	.4919	.5166	.4910	.2724	1

Table (6)
Rice Prices (Ngasein Variety), Burma:1948-86

Year	Procurement Prices Govt.	Free Market	Export Prices	Retail Prices Govt.	Free Market
	(----------		Kyat per ton		----------)
48/9	137	156	575	211	191
49/0	137	159	731	211	289
50/1	137	165	860	211	322
51/2	137	158	706	211	296
52/3	137	153	551	211	284
53/4	137	151	469	211	286
54/5	137	152	452	211	279
55/6	137	156	435	211	290
56/7	137	156	436	211	283
57/8	137	156	429	211	275
58/9	137	156	440	211	284
59/0	137	162	428	211	298
60/1	137	183	422	211	321
61/2	144	151	432	222	358
62/3	144	166	443	222	378
63/4	144	159	447	222	395
64/5	144	155	471	229	357
65/6	149	147	484	229	499
66/7	163	165	521	251	1400
67/8	172	209	578	265	1300
68/9	172	528	703	265	900
69/0	177	244	667	311	568
70/1	177	281	465	311	628
71/2	183	538	419	311	1038
72/3	210	582	512	427	1109
73/4	431	729	826	640	1344
74/5	431	744	1609	710	1366
75/6	431	679	1756	804	1283
76/7	431	579	1157	870	1123
77/8	431	732	1373	894	1368
78/9	446	1132	1439	935	1674
79/0	446	1211	1494	935	1176
80/1	472	1253	1506	935	1647
81/2	472	1833	2350	894	1289
82/3	472	1986	2510	894	1500
83/4	472	2291	1770	894	1834
84/5	472	2444	1577	894	2022
85/6	472	2521	1317	894	2126
86/7	472	2597	1421	894	2225

Sources: Agricultural and Farm Produce Trade Corporation, Rangoon, Burma;
A.D.B: Bank Staff Estimates(Burma); Report No. 2347-BA,1975;
MNPF: Report to the Pyithu Hluttaw (Peoples' Assembly), various issues
CSED: Statistical Yearbook 1955 & 1965;
UN Statistical Yearbook 1960 & Monthly Bulletins (various issues)

Table (7)

Formula Table for Compulsory Delivery Quota of Paddy*

Sown acres	Yield per acre	Production	Compulsory delivery Q'ta	Quota as%of production
2	20	40	4	10
5	20	100	8	8
10	20	200	33	17
15	20	300	80	27
20	20	400	126	32
40	20	800	306	38
50	20	1000	396	40
2	30	60	4	7
5	30	150	30	20
10	30	300	117	38
15	30	450	215	47
20	30	600	307	51
40	30	1200	666	55
50	30	1500	846	56
2	40	80	6	8
5	40	200	114	57
10	40	400	199	50
15	40	600	347	58
20	40	800	486	60
40	40	1600	1026	64
50	40	2000	1296	65
2	50	100	64	64
5	50	250	101	40
10	50	500	282	56
15	50	750	481	64
20	50	1000	666	67
40	50	2000	1386	69
50	50	2500	1940	78

Source: Agricultural Corporation, Rangoon

* Units are shown here in acres and baskets as given in the original Table.
One basket of paddy equals 40 lbs. or 20.9 kg.
Delivery has to be made after deducting amount for home consumption, seeds, payment for hired inputs, and some allowance for wastage.

Chart 1. Growth trends of total net output, fixed inputs and current inputs, Burma; 1947/48-87/88.

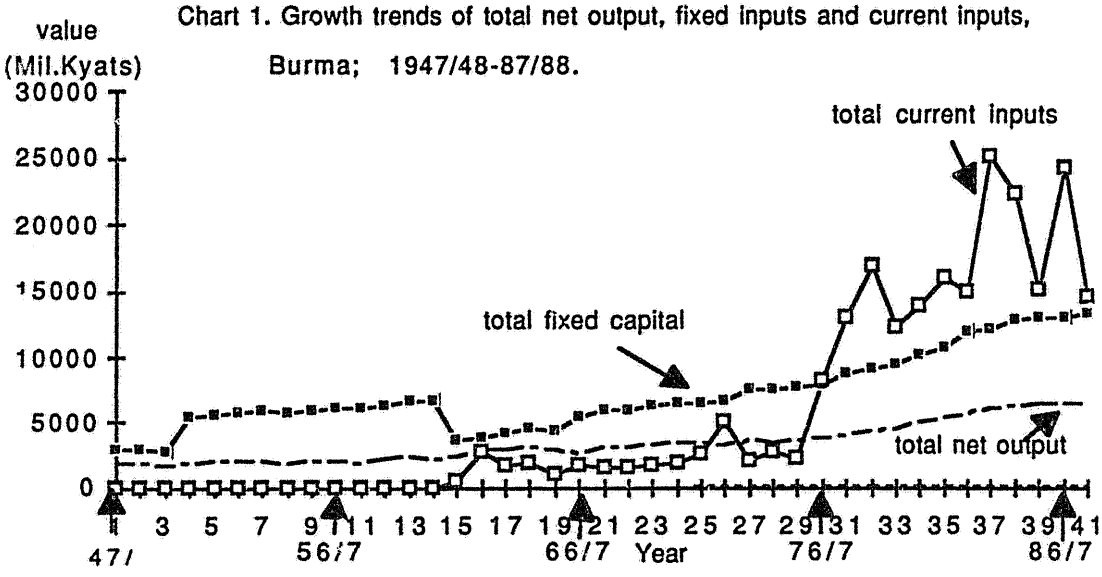


Fig. 2. Growth rates of labour and land productivities, Burma; 1949-88

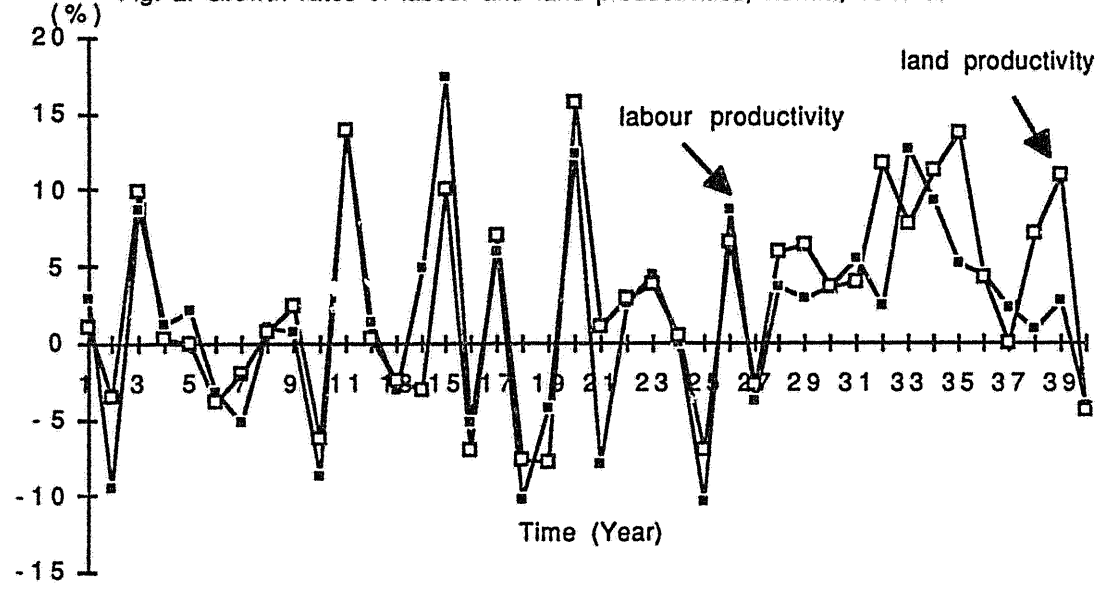
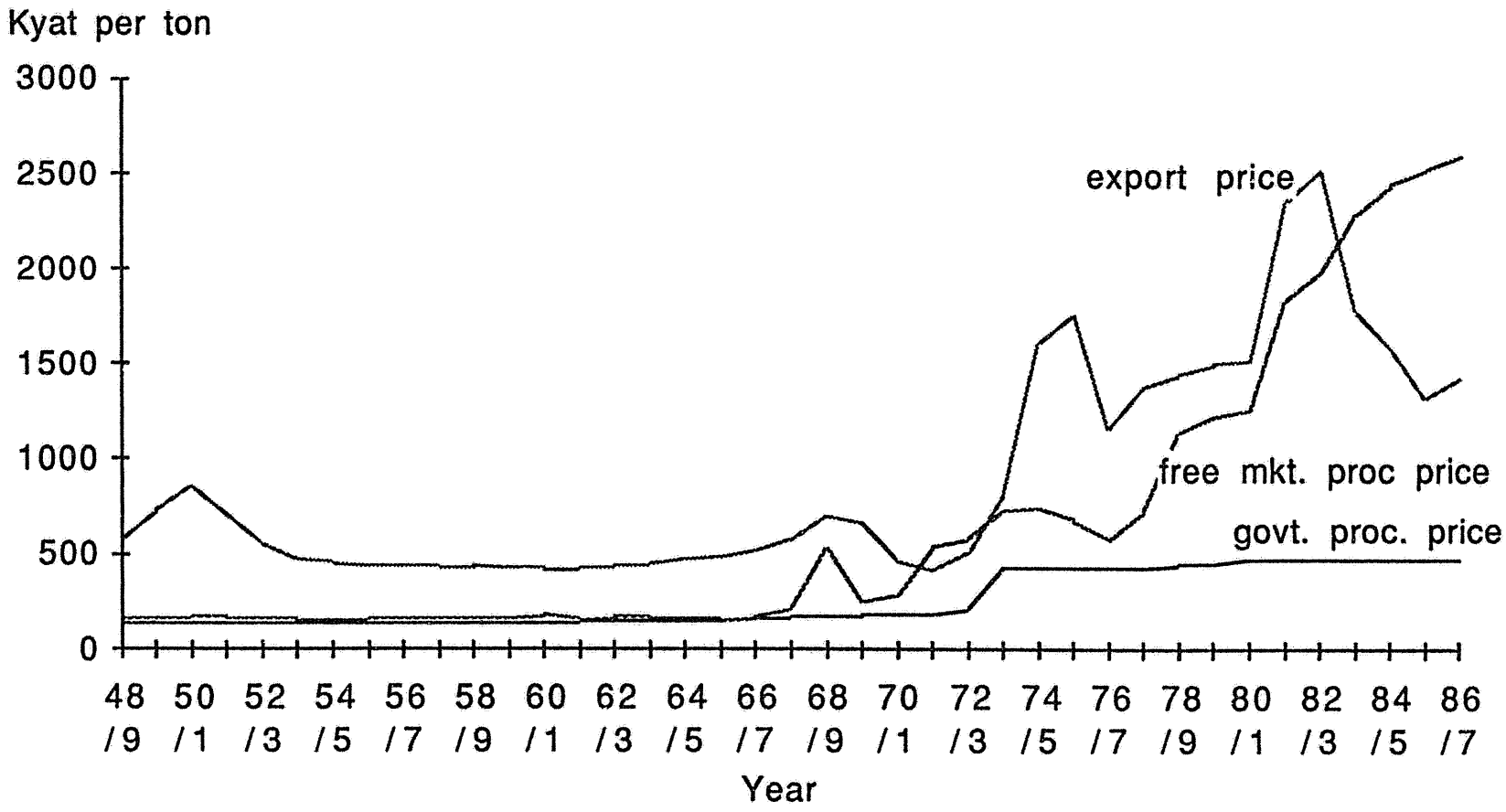


Fig.3. Procurement Prices and Export Prices of Rice, Burma; 1948-86



Source: Table 2